We claim:

1. A method for increasing the production of clavulanic acid in a host comprising the step of:

increasing the level of N^2-(2-carboxyethyl)arginine synthase in said host, wherein said N^2-(2-carboxyethyl)arginine synthase catalyzes the condensation of L-arginine and D-glyceraldehyde-3-phosphate, resulting in increased production of clavulanic acid.

2. The method of claim 1 wherein said step of increasing is performed by gene dosing.

3. The method of Claim 2 wherein said increasing step is performed by providing said host with DNA encoding said N^2-(2-carboxyethyl)arginine synthase.

4. The method of claim 3 wherein said DNA is in a plasmid.

5. The method of claim 4 wherein said plasmid is a replicating plasmid.

6. The method of claim 5 wherein said replicating plasmid is pKC1139/pro-orf2-ter.

7. The method of claim 3 further comprising integrating said DNA into the chromosome of said host.

8. The method of claim 7 wherein said DNA is stably integrated via an integrative vector selected from the group consisting of pSET152/pro-orf2, pSET152/ermE(XbaI)-orf2 and pSET152/ermE(HindIII)-orf2.

9. The method of claim 3 wherein expression of said DNA is under the control of a constituitive promoter.

10. The method of claim 3 wherein said constitutive promoter is *ermE**.

11. The method of claim 1 wherein said increasing step is performed by adjusting fermentation conditions and/or providing additives which effect the optimization of N^2-(2-carboxyethyl)arginine synthase activity, wherein said optimization results in an increase in the production of clavulanic acid

12. The method of claim 1 wherein said host is *Streptomyces clavuligerus*.

13. A method for increasing the production of clavulanic acid in a host comprising the step of:

increasing the availability of precursors for reaction by N^2-(2-carboxyethyl)arginine synthase, wherein said step of increasing results in an increase in the production of clavulanic acid.

14. The method of claim 13 wherein said precursors are L-arginine and D-glyceraldehyde-3-phosphate.

15. The method of claim 13 wherein said host is *Streptomyces clavuligerus*.

16. The method of claim 13 wherein said increasing step is achieved by adjusting fermentation conditions and/or providing additives which optimize N^2-(2-carboxyethyl)arginine synthase activity.

17. A method for increasing the production of N^2-(2-carboxyethyl)arginine in a host cell, comprising,

enhancing a rate of condensation of L-arginine and D-glyceraldehyde-3-phosphate in said host cell, wherein said step of enhancing results in an increase in the production of N^2-(2-carboxyethyl)arginine in said host cell.

18. The method of claim 17 wherein said condensation of L-arginine and D-glyceraldehyde-3-phosphate is catalyzed by the enzyme N^2-(2-carboxyethyl)arginine synthase.

19. The method of claim 17 wherein said step of enhancing is carried out by increasing the copy number of a gene encoding N^2-(2-carboxyethyl)arginine synthase.

20. The method of claim 17 wherein said step of enhancing is carried out by adjusting fermentation conditions and/or providing additives which optimize N^2-(2-carboxyethyl) arginine synthase activity.

21. A method for preparing an composition having N^2-(2-carboxyethyl)arginine synthase activity, comprising the steps of

growing a culture of a host cell capable of synthesizing N^2-(2-carboxyethyl)arginine synthase,

harvesting and sonicating said culture,

removing cellular debris to produce a cellular supernatant,

fractionating said supernatant with ammonium sulfate to form a precipitated protein pellet,

resuspending said precipitated protein pellet to form a protein solution, and,

chromatographing said protein solution by affinity chromatography to isolate a

thiaminepyrophosphate-dependent enzyme having N^2-(2-carboxyethyl)arginine synthase activity.

22. The method of claim 21 wherein said affinity chromatography is carried out with an L-arginine agarose affinity column.

23. The method of claim 21 wherein said host is *Streptomyces clavuligerus*.

24. The method of claim 21 wherein said step of fractionating is carried out with 30% ammonium sulfate.

25. An assay for identifying substrates of the enzyme N^2-(2-carboxyethyl)arginine synthase, comprising the steps of

incubating a putative substrate with the enzyme N^2-(2-carboxyethyl)arginine synthase, thiaminepyrophosphate, and one known substrate of N^2-(2-carboxyethyl)arginine synthase, and

detecting the presence or absence of a condensation product of the putative substrate and the known substrate, wherein the presence of a condensation product is a positive result.

26. The assay of claim 25 wherein said known substrate is L-arginine.

27. The assay of claim 25 wherein said known substrate is D-glyceraldehyde-3-phosphate.

28. A host cell stably transformed with *orf2*.

29. The host cell of claim 28, wherein said host cell is *Streptomyces clavuligerus*.

30. A condensation product of two substrates condensed by N^2-(2-carboxyethyl)arginine synthase.